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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,269	07/30/2001	Noriyuki Kaifu	35.C15635	8681

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FITZPATRICK CELLA HARPER & SCINTO  
30 ROCKEFELLER PLAZA  
NEW YORK, NY 10112

EXAMINER
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WANG, GEORGE Y

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 01/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/916,269

Applicant(s)

KAIFU ET AL.

Examiner

George Y. Wang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 December 2002.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 27 November 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Drawings***

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 27 November 2002 have been approved by Examiner. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admission of Prior Art (AAPA) in view of Spivey et al. (U.S. Patent No. 5,528,043, from hereinafter "Spivey").

AAPA discloses a radiation image sensing apparatus and method having and using an image sensing unit (fig. 9, ref. 102) and a control circuit (fig. 9, ref. 106) for stopping emission of radiation. However, AAPA does not specifically disclose an image sensing unit that has a non-destructive reading, with switch transistors, reading transistors, and reset transistors. Furthermore, AAPA fails to specifically teach an image sensing unit that has a pixel portion with a photoelectric conversion element connected to a control terminal of a reading transistor.

Spivey discloses an image sensing unit that has a non-destructive reading (col. 4, lines 3-10) with switch reading modes defined by switching transistors (fig. 3, ref. 56), a reading transistor (fig. 5, ref. 110), a reset transistor (fig. 5, ref. 26), and a pixel portion (fig. 1, ref. 9; fig. 5) with a photoelectric conversion element (fig. 3, ref. 10) connected to a control terminal of a reading transistor (fig. 3, ref. 41). Furthermore, Spivey discloses a load of constant current from transistor (col. 8, lines 14-15) connected to the main electrode terminal with voltage amplification of approximately 1 (col. 8, lines 17-22).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated an image sensing unit, with all its aforementioned elements, for non-destructive reading as recited above since one would be motivated to provide even distribution of stored voltages across the sensing array

proportional to the distribution of x-ray photons incident on the absorbing layer (col. 2, lines 31-34). Circuitry in each pixel provides for the voltage on each pixel to be recorded via readout circuitry and permits the resetting of the pixel capacitors, which results in many advantages because of CMOS technology, such as better circuit performance, design flexibility, and unity in circuitry readout (col. 2, lines 36-42).

4. Claims 8-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Spivey in view of Brujins (U.S. Patent No. 5,778,044).

AAPA and Spivey disclose a radiation image sensing apparatus having an image sensing unit and a control circuit for stopping emission of radiation as recited above. However, the references fail to specifically disclose a control circuit having a pattern recognition circuit, detection circuit, and a generation circuit. Furthermore, the references do not specifically teach an addition and difference circuit that performs weighted additions and subtractions based on reference patterns, radiation amounts, reference values from pattern recognition circuit, and appropriate sensing times.

Brujins discloses an x-ray image pick-up apparatus with a control circuit (fig. 1, ref. 10) having a pattern recognition circuit (fig. 1, ref. 39), detection circuit (fig. 1, ref. 35), and a generation circuit (col. 5, lines 33-35). Furthermore, Brujins teaches an arithmetic circuit (fig. 1, ref. 11) that performs weighted additions and subtractions (fig. 3) based on reference patterns, radiation amounts, reference values from pattern recognition circuit, and appropriate sensing times.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated a control circuit having a pattern recognition circuit, detection circuit, a generation circuit, and an addition and difference circuit for performing weighted additions and subtractions based on reference patterns, radiation amounts, reference values from pattern recognition circuit, and appropriate sensing times since one would be motivated to derive and offset-corrected electronic image (col. 6, lines 22-29). When offset differences as well as gain differences are corrected, the corrected brightness values yield an image of high diagnostic quality (col. 6, lines 47-50). Notable disturbances of brightness values due to offset in electronic image signal as well as those due to vignetting are counteracted (col. 6, lines 50-56). The accuracy is even so high that, if the circumstances in which the x-ray images are picked up do not vary too much, a substantially disturbance-free composite image can be derived with a fixed set of correction values (col. 6, lines 64-68).

### ***Response to Arguments***

5. Applicant's arguments filed 27 November 2002 have been fully considered but they are not persuasive.

Applicant argues that the Spivey reference does not specifically disclose a control circuit which stops emission of radiation from the radiation source on the basis of a signal obtained by non-destructively reading the electric signal converted in the image sensing unit (pg. 7). Examiner notes, however, that Spivey does disclose the ceasing of emission from the radiation source when the collected positive charges becomes

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constant (col. 3, line 67 – col. 4, line 3). This constancy arises from the voltage across the capacitor at each pixel being recorded non-destructively within the circuit (col. 4, lines 1-10). Therefore, Examiner asserts the validity of the Spivey reference and maintains rejection.

### ***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 703-305-7242. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 703-305-3492. The fax phone numbers

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for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

gw  
January 7, 2003

  
ROBERT H. KIM  
SUPERVISOR, PATENT EXAMINER  
TECHNOLOGY CENTER 2800